Critical Decision 4
Approve Start of Operations
for the
Neutrinos at The Main Injector Project
at the
Fermi National Accelerator Laboratory
Office of High Energy Physics
Office of Science

Purpose

The purpose of this paper is to document the review by the Office of Science Energy Systems Acquisition Advisory Board-equivalent for Critical Decision 4 (CD-4), "Approve Start of Operations" for the Neutrinos at the Main Injector (NuMI) Project at the Fermi National Accelerator Laboratory (Fermilab).

Project Description

The NuMI Project provides for the construction of an intense, variable energy, beam of neutrinos using the Fermilab Main Injector, as well as large underground neutrino detectors located at Fermilab and Soudan, Minnesota. The purpose of the project is to enable a new generation of long baseline neutrino experiments that can decisively detect and accurately measure neutrino oscillations. Detection of such oscillations would firmly establish a non-zero value of neutrino mass. The scope of the NuMI Project includes the excavation of large underground laboratories to house the neutrino beam system and the Main Injector Neutrino Oscillation Search (MINOS) detectors. The project was initiated in FY1998 and has a Total Project Cost (TPC) of $171M.

The technical commissioning goals of the project are:

- Proton intensity in the Target Hall of greater than $1x10^{12}$ 120 GeV protons per spill
- Proton direction established to within 1 mr of the known direction to the Far Detector in the Soudan Mine
- Neutrino beam energy of 2-4 GeV
- The majority of the 153 Near Detector planes sensitive to muons
- Observation of neutrinos in the Near Detector produced by the NuMI beam
- The majority of the 484 planes of the Far Detector sensitive to muons and atmospheric neutrinos

Critical Decision 4 Requirements

All requirements for CD-4 approval are completed:

- NuMI installation completed
- Final Safety Assessment Document/Accelerator Safety Envelope approved
- Accelerator Readiness Review completed
- NuMI Commissioning Report verified commissioning goals met
- SC/HEP Project Review recommended CD-4 approval

Project Completion

The scope of the project was to construct facilities at Fermilab in Batavia, Illinois and at the Soudan Underground Laboratory (SUL) in Soudan, Minnesota. The project includes the design and construction of a beam line and experimental facilities at the Fermilab site, two multi-purpose detectors for the MINOS experiment (a Near Detector at Fermilab and a Far Detector at SUL), and modifications of the SUL to accommodate the Far Detector.

The NuMI Project started in FY1998 and was completed in February 2005, seven months ahead of schedule. There are no remaining significant issues or corrections (technical, ES&H, etc.) that will impact the final TPC. The NuMI Project will be completed under the TPC of $171M. The project cost will be finalized in the Project Closeout report, which will be issued in the summer of 2005.

All punch list items have been corrected by subcontractors and all equipment/systems meet design specifications. All specified field and factory testing have been completed and accepted by Fermilab.

Submitted by:

Stephen L. Webster — 2/24/05
Stephen L. Webster
Federal Project Director
Fermi Site Office

Joanna M. Livengood — 2/24/05
Joanna M. Livengood
Acting Manager
Fermi Site Office

Phil Debenham — 2.25.05
Phil Debenham
Program Manager
Research and Technology Division
Office of High Energy Physics

Robin Staffin for RS — 2/25/05
Robin Staffin
Associate Director
Office of High Energy Physics

Recommendations:
The undersigned "Do Recommend" (Yes) or "Do Not Recommend" (No) approval of CD-4, Approve Start of Operations, for the NuMI Project at Fermilab as noted below.

2/28/05 Yes X No___
ESAAB Secretariat, Construction Mgmt Support Division Date

2/28/05 Yes X No___
Representative, Non-Proponent SC Program Office Date

2/28/05 Yes ✓ No___
Representative, Financial Mgmt. Division Date

2-28-05 Yes ✓ No___
Representative, Environmental, Safety and Health Division Date

Yes X No___
Representative, Security Mgmt. Team Date

Yes___ No___
Representative, Laboratory Infrastructure Division Date

Yes___ No___
Representative, Grants and Contracts Division Date

The project was completed ahead of schedule and within the TPC. DOE Fermi Site Office (FSO) personnel have verified completion of work and accepted the project. Based on the information provided, closeout and acceptance of the project is requested.

Approval of CD-4

James F. Decker, Acquisition Executive
Director
Office of Science

2/28/05
Date